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April 1, 2011

Mr. Philip Isorena  
Chief, NPDES Unit  
State Water Resources Control Board  
Division of Water Quality, 15<sup>th</sup> Floor  
1001 I Street  
Sacramento, CA 95814

**Re: Contra Costa Generating Station Implementation Plan for the Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Policy)**

Dear Mr. Isorena,

GenOn Delta, LLC (GenOn Delta) owns and operates the Contra Costa Generating Station (CCGS), which is subject to the Policy. Attached is GenOn's Implementation Plan for the CCGS, submitted pursuant to Section 3(A)(1) of the Policy and the November 30, 2010 letter from the State Water Resources Control Board (State Board) setting forth information requirements related to the Policy's requirement to submit implementation plans. Per correspondence with State Board staff, GenOn Delta is not submitting a new NPDES permit application and Report of Waste Discharge given the pending retirement of the CCGS, as described in the attached Implementation Plan.

Please contact me with any questions at (925) 427-3567 or [peter.landreth@genon.com](mailto:peter.landreth@genon.com).

Sincerely,

Peter Landreth  
Director, California Environmental Policy  
GenOn Delta, LLC



**CONTRA COSTA GENERATING STATION IMPLEMENTATION PLAN FOR THE  
STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND  
ESTUARINE WATERS FOR POWER PLANT COOLING**

**GenOn Delta, LLC**

April 1, 2011

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## **I. INTRODUCTION**

GenOn Delta, LLC (GenOn Delta), intends to comply with the State Water Resources Control Board's "Statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling" (Policy) at the Contra Costa Generating Station (CCGS) by permanently retiring its two once-through cooled units before the prescribed deadline of December 31, 2017.

In 2009, GenOn Delta entered into a tolling agreement with Pacific Gas & Electric (PG&E) that provides the CCGS will shut down at midnight April 30, 2013, subject to regulatory approvals. GenOn Delta made this commitment enforceable through amendments to its Clean Air Act Title V Permit and Permit to Operate, issued by the Bay Area Air Quality Management District (BAAQMD). Those permits now contain the following relevant permit condition: "Subject to... the receipt of all other approvals and consents from the relevant local, state and federal governmental agencies (including but not limited to the California Independent System Operator) necessary for the shutdown and permanent retirement from service of Units 6 and 7[,] Mirant Delta, LLC will shut down and permanently retire Units 6 and 7 from service at 2400 PDT on April 30, 2013."<sup>1</sup> The California Independent System Operator (CAISO or California ISO) has stated that it does not foresee a need for either CCGS unit after the Marsh Landing Generating Station (MLGS), a new facility currently under construction and owned by an affiliate of GenOn Delta, becomes operational, as the new generation capacity and energy provided by the MLGS will effectively displace the capacity and energy currently provided by the CCGS.

Accordingly, GenOn Delta anticipates that the CCGS will shut down as expected at the end of April 2013, and that the CCGS will therefore achieve compliance with the Policy.

GenOn Delta understands that certain interim requirements in Section 2(C) of the Policy apply to the CCGS pending shutdown. The remainder of this Implementation Plan addresses the CCGS' compliance with that provision. Section II of this Plan describes the CCGS and specifically its once-through cooling operations and related flows. Section III documents GenOn Delta's compliance with the Policy's interim requirements.

## **II. FACILITY DESCRIPTION**

The CCGS is located on the San Joaquin River near the City of Antioch in unincorporated Contra Costa County. It originally consisted of seven once-through cooled natural gas-fired generating units. Units 1-3 and accompanying small house generating units were built in 1951 and retired in 1995. Units 4&5 were built in 1953 and were retired for energy generation in 1995 and fully retired from use as synchronous condensers in 2007. Units 6&7 were built in 1964, are still in operation and generate a total of 690 gross megawatts (MWg) of power (345 MWg per unit). As constructed, the total cooling water design flow required to service Units 1-7 was approximately 685,200 gallons per minute (gpm), or 986.5 million gallons per day (MGD). Currently, Units 6&7 are the only generating units at CCGS. The total maximum

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<sup>1</sup> On December 3, 2010, Mirant Corporation and RRI Energy completed a merger to form GenOn Energy, Inc. In connection with the merger, Mirant Delta, LLC changed its name to GenOn Delta, LLC.

design flow for both Unit 6 and Unit 7 combined is approximately 305,600 gpm, or 440 MGD. Thus, since 1995, CCGS maximum circulating water pump flow has decreased by 546.5 MGD, or 55%.

The CCGS was originally a baseload operated facility. However, capacity utilization rates at Units 6&7 have decreased significantly over the last decade and have consistently been in the low single digits for several years. Table II-1 provides the capacity utilization rates for the CCGS units for the most recent 5-year period (2006–2010). In 2010, annual capacity factors for Unit 6 and Unit 7 were 0.2% and 0.6%, respectively. GenOn Delta anticipates that Units 6&7 will continue to generate at similar low levels until they retire in 2013.

**Table II-1: Annual CCGS Capacity Factors 2006–2010**

Year	Annual Capacity Factor (%) Contra Costa Generating Station	
	Unit 6	Unit 7
2006	0.8	3.9
2007	1.4	3.3
2008	1.9	3.4
2009	0.7	6.0
2010	0.2	0.6
Five Year Average	1.0	3.4

The Units 6&7 intake structure is located on the San Joaquin River shoreline, immediately north of Units 6&7 themselves. The bottom of the intake structure is approximately 14 feet below Mean Sea Level. The intake facility is a concrete structure with a screen design that includes bar racks, traveling screens and screenwash system, and a circulating water pump system.

Each unit has two 76,400 gpm circulating water pumps, and at maximum design flow they are run simultaneously and furnish a combined design flow total of 305,600 gpm of cooling water to the Units 6&7 condensers. Single-pump operation occurs only during maintenance inspections and outages. In single-pump operation, electrical generation is limited to less than 50% of a unit’s maximum capacity. These circulating water pumps were initially retrofitted with Variable Speed Drive (VSD) controls in 1987, allowing them to be operated from 50% to 95% of their rated capacity. In early 2004, consistent with resource agency mitigation requirements and to reduce impingement and entrainment effects, the VSD controls were replaced with updated Variable Frequency Drive (VFD) technology. When operating in VFD mode, the circulating water pump speed/flow is typically at its minimum level when the unit is at minimum load. The minimum circulating water pump speed/flow is set at 50% of design flow. The minimum circulating water pump speed/flow may vary due to the temperatures of the intake water or the

cleanliness of the condenser tubes (commonly measured as backpressure). In general, the minimum speed/flow will be between 50–60% of design flow at loads less than 65 MWg. As unit load increases, pump speed and flow are increased in accordance with unit conditions. The VFD control procedure is written as follows:

There are two modes of VFD operation depending on the time of year. Generally, from May 1 to July 15, a feed forward curve controls the circulating water pump speed at 50% speed until 172 MWg is achieved. The speed then gradually ramps to 95% speed at 322 MWg. The speed is maintained at 95% through a full load of 345 MWg. A discharge temperature setpoint of 85°F also cascades into the control logic to increase or decrease the pump speed as needed. The pump speed is always maintained for minimum flow and optimum temperature (<86°F) in the range of 50 to 95% except in the rare occurrence when a condenser backpressure greater than 2.0 inches Hg is impacting the reliability of the unit. Except during conditions of electrical grid system reliability as dictated by the Independent System Operator (ISO), the unit load is reduced to prevent pump speed from exceeding 95% due to either exceeding a backpressure of 2.0 inches Hg or exceeding discharge temperature of 86°F.

During the remainder of the year, a feed forward curve maintains 50% of speed until 65 MWg when the speed is gradually ramped to 100% at 115 MWg. The 100% speed curve is maintained through full load at 345 MWg. Turbine backpressure is cascaded into the control logic to allow a maximum backpressure of between 0.8 and 1.8 inches Hg between 50 and 345 MWg. Exceeding the turbine backpressure curve will allow the pump speed to exceed the feed forward curve.

The Units 6 & 7 intake structure is equipped with six bar racks, each approximately 22 feet long and spaced 4.0 inches on center, are located about 15 feet in front of the vertical traveling screen system. The bar racks prevent the entry of large objects into the cooling water system. Six vertical traveling screens with a mesh size of 3/8 inch retain smaller objects. Each traveling screen is comprised of 30 screened “panels.” Each panel is approximately 10 feet wide and 2 feet tall. A high-pressure screenwash spray system removes any debris or fish that have become impinged on the screen face. The traveling screens are rotated and rinsed at a minimum of once every four hours whenever the circulating water pumps are operating.

Cooling water withdrawal and discharges are authorized under NPDES Permit No. CA0004863 (Central Valley Regional Water Quality Control Board Order No. 5-01-107), which GenOn Delta intends to terminate when Units 6&7 shut down. Cooling water flows from each unit are kept separate from each other and are ultimately directed into a discharge canal. The discharge canal joins the river approximately 800 feet east of the Units 6&7 intake structure.

The Units 1-5 intake structure no longer provides any cooling water flows. Low-volume, intermittent station service water pumps, as well as fire suppression system pumps, are housed in the retired Units 1-5 intake structure, which is located approximately 250 feet offshore in the San Joaquin River. The station service water pumps were historically used to provide bearing cooling water for auxiliary equipment, but this use was discontinued in June 2010. The station service pumps now provide back-up auxiliary service, and one 2,000 gpm pump is operated approximately once per month for eight hours to maintain system

reliability. The Units 1-5 intake structure does not withdraw any water for once-through cooling purposes, and the total average flow through the 1-5 structure is approximately 0.066 MGD, with an approach velocity of less than 0.02 feet per second.

### **III. INTERIM COMPLIANCE REQUIREMENTS**

#### **a. Offshore Intake Screening**

The CCGS does not use an offshore intake for once-through cooling, and therefore Section 2(C)(1) of the Policy is inapplicable.<sup>2</sup>

#### **b. Curtailment of Intake Flows**

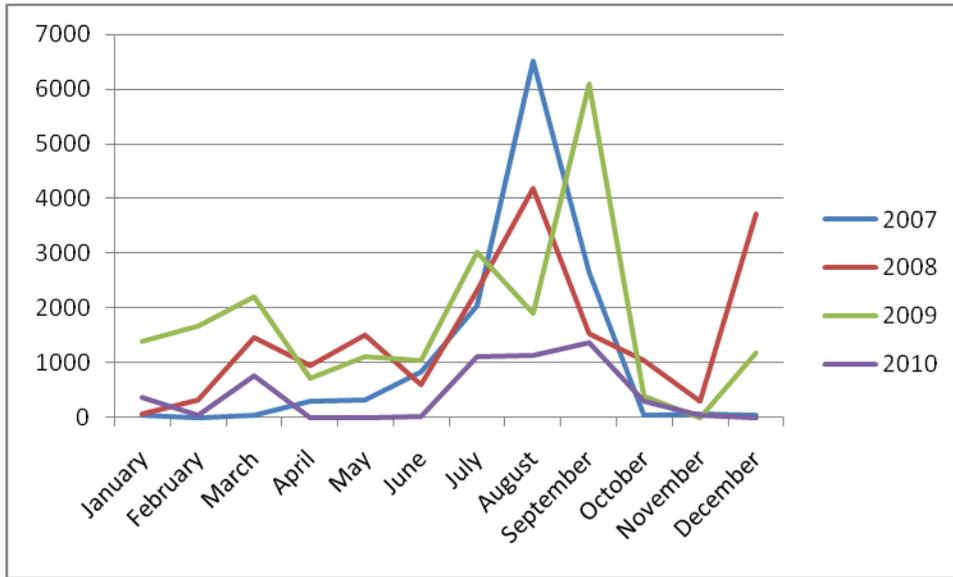
Section 2(C)(2) of the Policy requires an existing power plant unit that is subject to the Policy to cease intake flows when not engaging in power-generating activities, or critical system maintenance, unless a reduced minimum flow is necessary for operations. As described in Section II above, GenOn Delta already minimizes power-generation flows by utilizing VFDs. All other intake flows described in Section II above are either directly related to power generation or critical system maintenance, and no additional flow curtailments are proposed. Upon retirement of Units 6&7, there will be no further cooling water flows.

The November 30, 2010 Implementation Plan Requirements letter requested “information regarding when it is likely that each unit in your facility may not be generating power, or when you are performing critical system maintenance that would result in the cessation of flows.” As illustrated in the graph below, CCGS operations are typically concentrated in the hottest summer months, when demand for generation is highest, but generation can and does occur throughout the year. Under the terms of its tolling agreement with PG&E, GenOn Delta has no control over when the units may be dispatched. Accordingly, while a discussion of monthly generation trends can indicate when flows are more or less likely to occur during the year, based on likely electrical demand, they are only illustrative, and GenOn Delta could not guarantee that the annual generation profile in a given year will look exactly the same as another year. Since GenOn Delta employs VFDs year-round, power-generation flows are minimized whenever generation occurs. Accordingly, GenOn Delta is already in compliance with Section 2(C)(2).

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<sup>2</sup> The retired Units 1-5 structure is located offshore, but it is currently used for only very low-volume intermittent flows that amount to a negligible 0.066 MGD flow with an approach velocity of less than 0.02 feet per second, therefore posing no threat to large organisms such that a large organism exclusion device would be warranted.

**Figure III-1: CCGS Monthly Flows 2007-2010 (MG)**



**c. Interim Mitigation**

Since the CCGS will retire in 2013, the requirement to implement interim mitigation measures on or after October 1, 2015 is not relevant for the CCGS. It is worth noting, however, that the CCGS will continue to implement VFDs year-round and that GenOn Delta is already compensating for interim impingement and entrainment impacts through compliance with the federal and state Endangered Species Acts authorizations for the CCGS and at GenOn Delta's Pittsburg Generating Station (see GenOn Delta's Implementation Plan for the Pittsburg Generating Station for more details).